# Technological Unemployment

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Preprint / Preprint
Sammelwerksbeitrag / collection article

M. Klimczuk-Kochańska, A. Klimczuk, *Technological Unemployment*, [in:] M. Odekon (ed.), *The SAGE Encyclopedia of World Poverty, 2nd Edition*, SAGE Publications, Thousand Oaks 2015, pp. 1510–1511. https://doi.org/10.4135/9781483345727.n783

# Technological Unemployment

Technological unemployment is a situation when people are without work and seeking work because of innovative production processes and labor-saving organizational solutions. Technical progress, automation, and the mechanization of production processes reduce the need for human work in different sections of professions. Technological unemployment is an element of structural unemployment associated with the restructuring of industry and agriculture and the reduction of work demand in certain branches. Unemployment may be permanent or temporary, depending on the possibility of retraining, a change of employees' careers. The size of mismatch and the need for new training is greater in the case of radical innovations than in incremental innovations. Radical innovation is a departure from the previously known technology that disrupts the existing business model of a company or industry. For example, power looms reduced the work of artisans, the Internet replaced traditional mass media, and microchips enabled the production of mobile phones. Incremental innovation is a new edition of products and services based on the same technology.

## Compensation Theory and Its Critics

Mainstream economists from the end of the 18th century, such as James Steuart, Adam Smith, Jean Baptiste Say, Thomas Malthus, David Ricardo, and John Maynard Keynes, were convinced that the economy could compensate for the negative employment effects of technological change. They argue that technological unemployment is a temporary circumstance that is automatically compensated by the market and job changes of employees. Technological unemployment is a temporary phase of maladjustment, but in the long run, society will resolve that problem and create a high standard of life for all citizens. Compensation will occur by mechanisms such as additional employment in the capital goods sector, decreasing prices of goods because of lower production costs made possible by using new technologies, investments made by using profits from technological change, and increasing income in society from the redistribution of profits from the use of innovation.

Karl Marx presents the most notable criticism of compensation theory. He instead proposes the concept of capital accumulation. The increase and concentration of wealth produced by technological change are more profitable for owners, such as manufacturers, than for other groups, such as employees. Marx argues that industries, by using new labor-saving machines, are unlikely to generate a sufficient number of jobs. The cotton industry and agricultural production are examples where using machines reduced the employment of workers and their

wages, while wages grew for highly skilled operating personnel and company owners. Marx argues that unemployment grows faster than the accumulation of capital demand for new workers. Thus, capitalism is based on the constant search for new production technologies, new products, and innovation, which was later called a "creative destruction" by Joseph Schumpeter. Marx concludes that high unemployment brings lower wages and thus greater control over workers. However, the accumulation of capital leads to problems with demand.

## Concept of Massive Technological Unemployment

Contemporary researchers, such as Jeremy Rifkin, Erik Brynjolfsson, and Andrew McAfee, argue that post-industrial societies are increasingly characterized by "the end of work." In this concept, economic systems do not have any automatic mechanisms that can ensure a continuous compensation of professions. In the 21st century, it may lead to the collapse of labor markets and societies through a range of negative social phenomena related to unemployment. The concept of massive technological unemployment is based on examples of reduction of demand for work in such industries as telecommunications, postal service, office work, robotics, and the computerization of trade.

Technological unemployment also affects management personnel and intellectual workers like teachers, musicians, artists, and writers. It is not simply replacing human labor with machines, but the reconstruction of the economic system, reorganization of the knowledge and skills-acquiring processes by staff, the emergence of new markets and industries, and the development of new needs. Rifkin suggests that new jobs can be created in a more social economy or third sector, created by non-governmental organizations. These new jobs will be more volunteer than paid. Such jobs will be largely related to social, cultural, and leisure time activity, care, education, and defending of human rights. Moreover, the social economy will be based on social capital, with the indicators of trust, cooperation, mutual exchange, and companionship.

## Technological Unemployment and Developing Countries

Globalization of the economy is increasing demand for new technologies. However, this market does not meet the needs of the poor, who have little purchasing power. Research and development of technology are mainly focused on the needs of transnational corporations from developed countries. Technological innovations neglect the demands of people from developing countries. Thus, innovations bring more accumulation of capital, poverty, and

inequality. Decisions of transnational corporations about the location of new plants in developing countries are often influenced by the need to be close to a potential new market and to use labor-cost differentials. However, new technologies are used in investments into automated production facilities that generate technological unemployment because fewer laborers are needed when they can no longer compete with the cost efficiency, quality control, and speed of delivery. The higher production capacity of plants located around the world also leads to the deindustrialization of developed countries, or some of their regions, and structural unemployment in some sectors. In the 21st century, trends such as the third industrial revolution, the Internet, green technologies, and a service-based economy will generate only a few high-tech jobs for knowledge workers.

Developing countries, often because of social and cultural differences, have demands for other types of technology, such as technology that may bring more productivity without reducing workplaces with machines and mass production. For example, Mahatma Gandhi argued that a system of mass production based on human laborsaving technology assumes that people are already rich, and do not need work. Measuring the effectiveness of compensation mechanisms in developing countries is an even more complex issue than in developed countries. They mainly use imported technology. Thus, the first compensation mechanism that is related to the generation of employment in the capital goods sector is absent because technology is not locally invented and produced. This blocks the second compensation mechanism, related to the generation of substantial employment in the technology supplier sectors, which are mostly located in developed countries. The further expectation of compensation by a reduction in wages, which are already low in developing countries, is also valid and cannot bring more employment and redistribution of profits.

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**See Also**: Economic Growth and Technology; Employment Theory; Nonworking Poor; Technology and Public Policy; Unemployment.

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## Further Readings

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